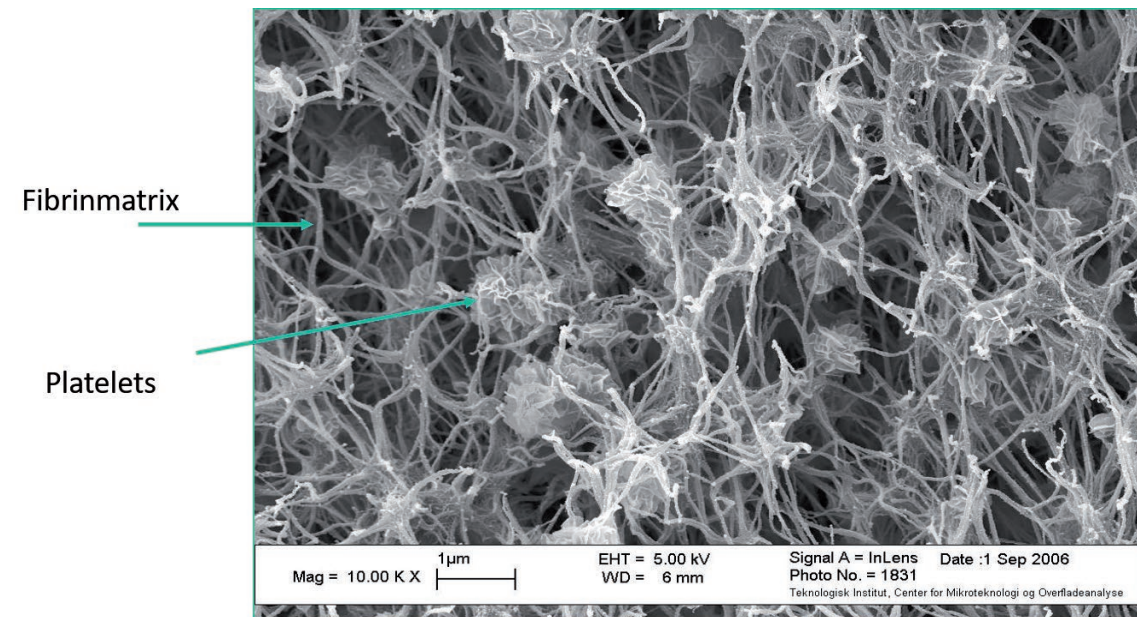


# OBSiDiAN ASG® – bioactive matrix



Scanning Electroscopic Microscope Image of OBSiDiAN ASG®

## Impulses for an optimum healing process

Difference between activated and non-activated thrombocytes

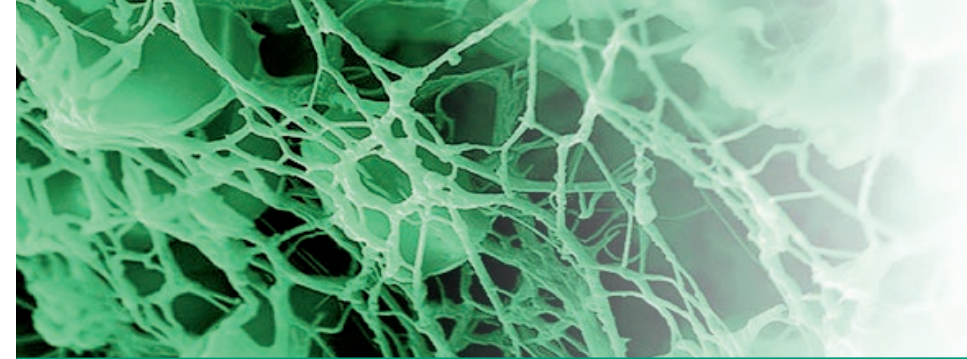
Obsidian ASG® is the world's only bioactive matrix with non-activated thrombocytes. In order to release the growth factors, the thrombocytes must first be activated with Thrombin. As soon as contact is established, the growth factors become active with an average lifespan of approximately 4 to 24 hours.

In the case of Obsidian ASG®, the thrombocytes are embedded and protected in a bioactive matrix. Use of Thrombin is dispensed with in the manufacturing process, thereby ensuring that the growth factors are not activated during production or immediately on application on the patient. Activation takes place during natural proteolytic absorption of the matrix over a period of 4 to 7 days, with healing stimulation being provided continuously over a defined time span.

## OBSiDiAN ASG® & OBSiDiAN ASG® Endo

Regenerative medicine of the future in colorectal surgery

- \* 100% autologous, bioactive matrix
- \* 7 to 10 times multiplied concentration of non-activated thrombocytes
- \* High elasticity
- \* High mechanical strength (25 mg/ml fibrinogen I)
- \* Applicable in all surgical techniques: open surgery, laparoscopy, endoscopy, robotics
- \* Immediate polymerisation and application control
- \* New application technology: intra-anastomotic application (IAA)
- \* Reduced foreign body reaction
- \* Avoidance of staple line bleeding
- \* 100% anastomosis sealing (airtight and waterproof)
- \* Doubling of the burst pressure directly after application
- \* Antibacterial effect
- \* Completely absorbable
- \* High user-friendliness
- \* Patented micro-spray technology



www.rivolution.de

## OBSiDiAN ASG® & OBSiDiAN ASG® Endo

Autologous bioactive matrix for optimum tissue regeneration



The Vivostat®-System is the first in the world of its type to offer a simple, fully automatic process for producing the platelet-rich Obsidian ASG® and Obsidian ASG® Endo bioactive matrices. The individual growth factors are decisive for the process of tissue regeneration (e.g. soft tissue, connective tissue, muscles or vascularisation). The Vivostat® system is used to produce blood platelets with different growth factors, which are embedded in the 100% autologous matrix. 120 ml of blood yields 5 to 6 ml of the platelet-rich Obsidian ASG® bioactive matrix.

Combining the autologous platelet concentrate with the bioactive matrix generates a carrier substance that ensures controlled delivery of growth factors over a period of 5 to 7 days. This makes Obsidian ASG® the perfect medium for accelerated growth of new blood vessels and tissue proliferation.

Furthermore, Obsidian ASG® has an antibacterial, 100% autologous effect and numerous unique properties that provide positive support for the healing process.



# Vivostat® – the system

The Vivostat® system is the first in the world of its type. It enables fully automatic production of the Obsidian ASG® matrix.



Das Vivostat® system comprises three components:

1. Processor unit
2. Applicator unit
3. Obsidian ASG® single-use set

## 1. Processor unit (PRO 800)

The processor unit is used to prepare the patient's blood and produce the bioactive Obsidian® matrix.

## 2. Applicator unit (APL 404)

The applicator unit is used for controlled application of the Obsidian ASG® matrix on the treatment area. The co-delivery applicator also facilitates application of medicinal products, drugs or stem cells together with Obsidian ASG®.



## 3. OBSiDiAN ASG® single-use set

The single-use set contains all the components necessary for the production and application of Obsidian ASG®.

### OBSiDiAN ASG® spray pen kit

(co-delivery, available as an option)  
The Vivostat® spray pen allows Obsidian ASG® to be applied precisely to the distal rectal stump and other structures to be treated.



### OBSiDiAN ASG® endoscopic kit

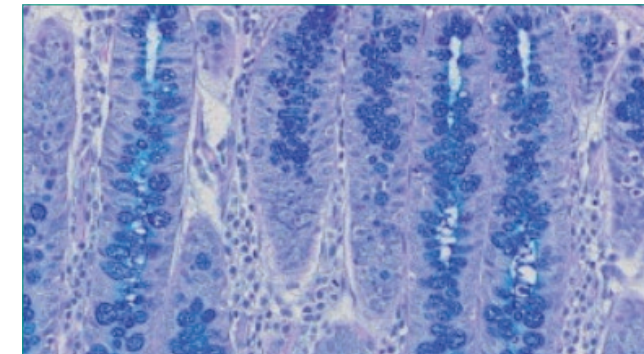
(co-delivery, available as an option)  
The endoscopy applicator is employed in minimally invasive surgery. It can be inserted easily into the endoscopic handle using a 5mm trocar.

## There are numerous co-delivery options with the Vivostat® co-delivery system:

stem cells (bone marrow stem cells), cells (keratinocytes), medicinal products (antibiotics, chemotherapeutics, pain medications); the highly efficient co-delivery method can significantly reduce the overall cost of several treatment methods.

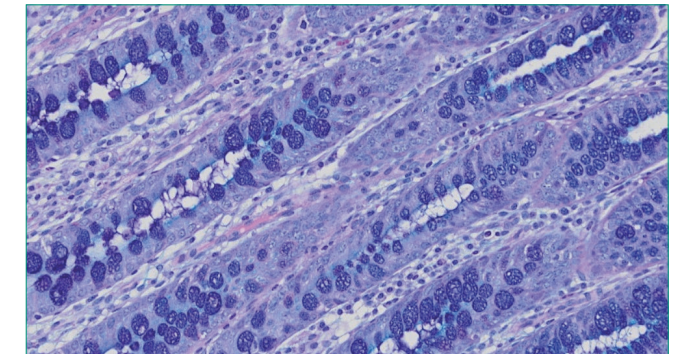
# OBSiDiAN ASG® – trial results

Preclinical trials have substantiated the positive effect on tissue regeneration provided by applying the bioactive ASG® matrix. During the course of a preclinical animal study, unambiguous criteria for an improved healing process thanks to the application of Obsidian ASG® were verified. Positive effects on increased growth of the epithelial cell layer; increased mucin population and increased M2 macrophage activity demonstrate the benefit of applying the bioactive Obsidian ASG® matrix in the case of colonic anastomosis.



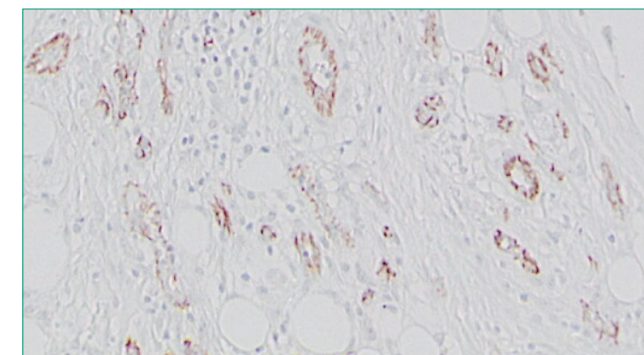
## Increased growth of the epithelial cell layer

Applying Obsidian ASG® increases and accelerates growth of the epithelial cell layer in the treated bowel area.



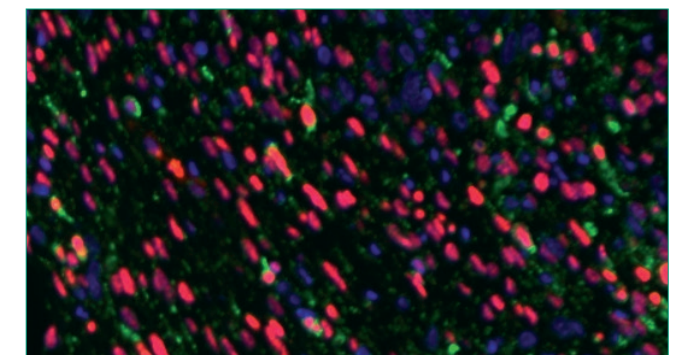
## Mucin content

Using Obsidian ASG® increases mucin protein population in the intestinal mucosa. This has a verifiable, positive influence on the protection and quality of the intestinal mucous membrane.



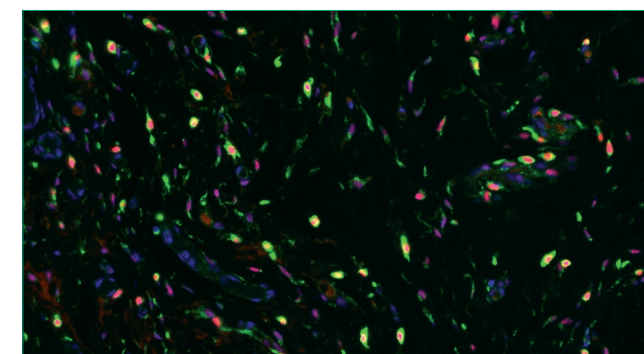
## Vascular density

Vascularisation (formation of fine blood vessels) is particularly important in the first 30 days of the healing period. Augmented neovascularisation was determined in the treated colonic region.



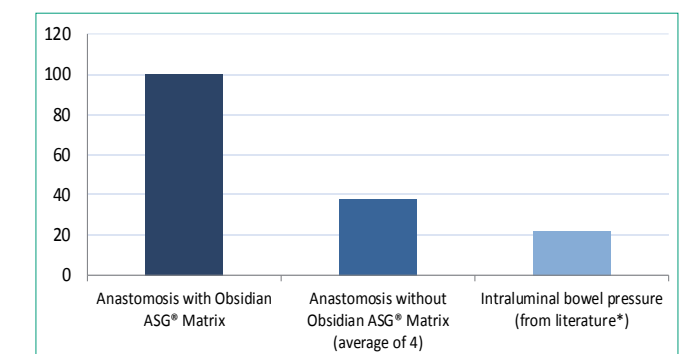
## Collagen maturation

Accelerated collagen restoration and conversion from collagen III to collagen I assists the anastomosis healing process and improves quality of the anastomosis from day one.



## Macrophage density

An increased proportion of M2 macrophages provides maximum stimulation of the anastomosis healing process.



## OBSiDiAN ASG® burst pressure:

day 0: 100 mmHg, day 4: 100 mmHg,  
day 10: 210 mmHg, day 30: 160 mmHg

100% support of anastomosis directly after application.